USSR

UDC: 519.2

LIPNIK, I. Yu.

"On the Probability of Large Deviations of the Cardinality of a Stationary Gaussian Process"

Probl. peredachi inform. (Problems in Data Transmission), 1972, 8, No 4, pp 55-67 (from RZh-Kibernetika, No 5, May 73, abstract No 5V43 by M. Gordin)

Translation: The author studies the asymptotic behavior of the quantity

$$P_T = P\left(\int_0^T \xi^2(t)dt > TR(0)x_T\right),$$

where $\xi(T)$ is a stationary centered Gaussian process with continuous time, $R(t)$ is its correlation function, and x_T depends on $T \in (0, +\infty)$. Let us assume that $R(0) = 1$, and that $\xi(t)$ has stationary spectral density $f(\lambda)$.

Let $M = \operatorname{ess\,sup} f(\lambda) < \infty$. Let us assume for $0 < h < \frac{1}{2M}$

$$\varphi(h) = (2\pi)^{-1} \int_{-\infty}^{\infty} f(\lambda)(1 - 2hf(\lambda))^{-1} d\lambda$$

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LINNIK, I. Yu., Probl. peredachi inform., 1972, 8, No 4, pp 55-67

and let $x_0 = \sup \varphi(h)$, $(x_0 < +\infty)$. We introduce the function $h(x)$, $1 < x < +\infty$ by the following equality:

$$h(x) = \begin{cases} \varphi^{-1}(x), & 1 < x < x_0, \\ \frac{1}{2M}, & x \geq x_0. \end{cases}$$

Now let

$$B(x) = (4\pi)^{-1} \int_{-\infty}^{\infty} \ln(1 - 2h(x) f(\lambda)) d\lambda + xh(x), \quad 1 < x < +\infty,$$

if $M < +\infty$. On the other hand if $M = +\infty$, then $B(x) \equiv 0$. As shown in the paper, for arbitrary spectral density $f(\lambda)$ we have the asymptotic form

$$\ln P_T = -TB(x_T)(1 + o(1))$$

uniformly over $x_T \in [1 + \delta, C]$ as $T \to +\infty$. Here and in the following δ is an arbitrarily small fixed positive number, and C is an arbitrarily large fixed positive number. On the other hand, if the function $t^{1,5+\alpha} R(t)$ is bounded and integrable for some $\alpha > 0$, then

$$P_T = T^{-0,5} A(x_T) \exp(-TB(x_T)(1 + o(1))$$

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LINNIK, I. Yu., Probl. peredachi inform., 1972, 8, No 4, pp 55-67

uniformly over $x_T \in [1+\delta, C]$ as $T \to +\infty$, the explicit form of the function $A(x)$ being given. A further refinement of the asymptotic form is given with stronger limitations on $R(t)$.

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USSR UDC 617.735-007.281:615.84.19-085.849.19[:617.7-018]-092.9

LINNIK, L. A., Candidate of Medical Sciences, and TOLSTOSHEV, A. V., Engineer, Odessa Scientific Research Institute of Eye Diseases and Tissue Therapy imeni Academician V. P. Filatov

"The Neodymium Laser. The effects of Its Radiation on Eye Tissue as Compared With The Ruby Laser"

Odessa, Oftal'molgicheskiy Zhurnal, No 8, 1971, pp 581-585

Abstract: The eyes of 60 rabbits were irradiated with a neodymium laser with 0.06, 0.09, 0.4, and 0.8 joules. Clinical and histomorphological invwatigations revealed that the neodymium laser causes considerable inflammation in the area of application and the surrounding zone. The severity and duration of the inflammatory reaction is proportional to the energy applied, but eventually a large atrophic area is formed. In contrast to the ruby laser, the neodymium laser produces neither edema nor hemorrhage into the vitreous body, but tends to coagulate the blood in the choroid blood vessels. It is concluded that neodymium lasers may be used for therapeutic purposes in clinical ophthalmology, including treatment of intraocular tumors.

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UDC 617.735+617.721.6]-085.849.19-092.9

LINNIK, L. A., Candidate of Medical Sciences, and FAVORIN, V. M. and PASHKOVA, V. V., Engineers, Odessa Scientific Research Institute of Eye Diseases and Tissue Therapy imeni V. P. Filatov

"Effect of Irradiation by Helium-Neon and Argon Gas Lasers on Eye Tissues and Prospects of Their Utilization in Ophthalmology"

Odessa, Oftal'mologicheskiy Zhurnal, Vol 26, No 6, 1971, pp 422-426

Abstract: Pigment variety rabbits were used in two series of experiments conducted to determine the effect of helium-neon and argon gas radiation on eye tissues. Energy doses not exceeding 0.5 milliwatts were used in series 1 of the experiments. The animals of this series were divided into two groups, with group 1 irradiated with helium-neon light in the form of a single beam, and group 2 -- with a diffused light, both directed toward the fundus oculi. Half of the animals in each group were irradiated respectively for 30 and 60 minutes. Prior to the experiments all of the animals were given 2 ml of a 1% solution of morphine intramuscularly. In the course of the experiments the eyes were irradiated with Ringer-Locke solution in order to reduce damage to the corneal membrane. It was found that a single application of the beam for 1/2

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LIBNIK, L. A., et al., Oftal'mologicheskiy Zhurnal, Vol 26, No 6, 1971, pp 422-426

a period of 30 minutes causes no permanent changes in the eye tissues. Repeated applications negatively affect the retinal membrane and the small vessels of the vascular system. The negative effect of the beam is more pronounced in the animals exposed to irradiation for a period of 60 minutes. Irradiation with the diffused light induces damages which are less manifested than those caused by the beam of light. The effect of argon on eye tissues was determined in the second series of the experiments. Energy doses within the range of 10-300 milliwatts were used. It was found that argon has pronounced coagulating properties when applied in doses of 25-45 milliwatts. In larger doses and particularly in doses of 100 or more milliwatts it causes considerable damage to eye tissues such as cell destruction, dilated vascular membranes, and edema of the retinal membrane.

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USSR

UDC: 621.315.592

ZUYEV, V. A., LITOVHENKO, V. G., GLINCHUK, K. D., LITOVCHENKO, N. M., SUKACH, G. A., and LINNIK, L. F.

"Current Carrier Recombination Processes on Ge and Si Surfaces Under Laser Excitation"

Leningrad, Fizika i tekhnika poluprovodnikov, No 10, 1972, pp 1936-1944

Abstract: While investigations of volume recombination processes of current carriers under laser excitation have been made and have yielded important information on the characteristics of local centers and new recombination mechanisms, investigations of surface processes have been limited to low excitation levels. The experiments described in this paper were designed to measure four effects: photoconductivity amplitude and relaxation time; absorption of infrared light by unbalanced current carriers; zone-zone recombination radiation intensity and relaxation; capacitor photo-emf. A block diagram of the experimental equipment is given. A neodymium laser operating at a wavelength of 1.06 microns and a ruby laser at 0.6943 microns, with maximum intensity of 10^{25} kW/cm^2·sec, were used to generate the unbalanced current carriers. A signal of

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USSR UDC: 621.315.592

ZUYEV, V. A., et al, Fizika i tekhnika poluprovodnikov, No 10, 1972, pp 1936-1944

infrared radiation was supplied by a 300 watt incandescent lamp with a germanium filter, and the receiver of the infrared radiation was a low-inertia photoresistance using germanium with a gold impurity. The authors thank O. V. Snitko, D. Pataki, and A. V. Sachenko for their useful comments on a number of problems encountered in the course of this work.

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USSR UDC 632.775

LINNIK, L. I., and LINNIK, V. T., Ukrainian Agricultural Academy

"Effectiveness of Several Preparations Against the Common Pear Sucker"

Moscow, Khimiya, v Sel'skom Khozyaystve, Vol 10 No 2 (100), 1972, pp 37-38

Abstract: The effectiveness of pesticides against the common pear (sucker Psylla pyricola) was studied in the irrigated pear orchard of the state farm technical school of the Crimean experimental horticulture station. The orchard is basically composed of Bere Bosk pear trees planted in 1932. The most effective preparations against the pear sucker were cidial in a 0.2 concentration, ultracide at 0.075%, fozalon at 0.3%, carbophos at 0.4%, and metaphos at 0.3%. The effectiveness of chlorophos was low. A single application of lindane was ineffective.

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USSR

UDC 632.934

LINNIK, L. I., LINNIK, V. T., Ukrainian Agricultural Academy

"Effectiveness of Organophosphorus, Organochlorine and Carbamate Preparations Against the Hawthorn Mite"

Moscow, Khimiya v sel'skom khozyaystve, No 11, 1971, pp 38-39

Abstract: A series of tests is described, conducted by the Crimean Experimental Station of Horticulture to determine the effectiveness of organophosphorus, organochlorine and carbamate acaricides. Tables are presented listing the individual compounds of each group in the order of effectiveness, concentration, initial pest population, reduced pest population after specific intervals. All organophosphorus compounds including Basudin and Endocid are shown to be of low toxicity. Of the organochlorine compounds, Kelthane appears to be most effective; Tedion and Rospin rank second in effectiveness. Mesurol, Acrex and MS-1945 of the carbamate group have shown high acaricidic activity.

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USSR

BABENKO, Z. I., VOYTENKO, A. N., LINNIK, L. I., PERMYAKOVA, N. M., SERGEYEV, YE. V., Ukrainian Scientific Research Institute of Plant Protection, Kiev, Ukrainian Academy of Agricultural Sciences

"Study of the Acaricidal Properties of 1,1-Diphenyl-2,2,2-trichloroethanol"

Moscow, Khimiya v Sel'skom Khozyaystve, Vol 8, No 6, Jun 70, pp 42-43

Abstract: The compound 1,1-diphenyl-2,2,2-trichloroethanol (I) is an analogue of a known acaricide, kel'tan, a long lasting contact agent. The effect of (I) on the mites Tetranychus urticae and Tetranychus viennensis Zacher was studied under laboratory and field conditions, respectively. In laboratory experiments (I) was slightly less effective than kel'tan. The opposite held true for the field tests: 90% of the mites had died by the second day when treated with (I), but only 48% died in three days when treated with kel'tan. After 15 days of treatment the activity of both compounds equilibriated with the number of surviving mites remaining around 10%. Phytotoxic properties of both compounds were about the same. 1/1

1/2 023 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--NATURE OF FALSE PEAKS IN A FARVITRON, IRON MASS ANALYSIS, SPECTRUM AND MEANS FOR ELIMINATING THEM -U-

AUTHOR-(04)-LINNIK, L.N., LOBACHEV, K.I., LINNIK, N.N., BATALOV, V.S.

COUNTRY OF INFO--USSR

SOURCE--PRIB. TEKH. EKSP. 1970, (2), 178-81.

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--SPECTRUM, ION, OSCILLATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

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2/2 023 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0136303

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REASONS ARE GIVEN FOR THE OCCURRENCE OF FALSE, FRACTIONAL, AND MULTIPLE MASS PEAKS IN THE FARVITRON SPECTRUM. SOME MEASURES FOR PREVENTION OF FALSE PEAKS ARE DESCRIBED. BY USING THE RELATION BETWEEN THE AMPLITUDES OF THE SIGNALS OF THE MULTIPLE AND BASE MASS, IT IS POSSIBLE TO DET. THE COEFF. OF ION ESCAPE IN THE PROCESS OF OSCILLATION IN THE DRIFT SPACE.

FACILITY: NAUCH. ISSLED. EKSP. INST. PERERAB. KHIM. VOLOKON, USSR.

UNCLASSIFIED

USSR

LINNIK, Yu. V., OSTROVSKIY, I. V.

"Expansion of Random Quantities and Vectors"

Razlozheniya sluchaynykh velichin i vektorov [English version above], Moscow, Nauka Press, 1972, 479 pages (Translated from Referativnyy Zhurnal - Kibernetika, No 8, 1973, Abstract No 8 V20 by G. Chistyakov)

Translation: This monograph sums up ten years of studies in the theory of expansion of random quantities and vectors, performed after publication of the well known book of Yu. V. Linnik, Razlozheniya veroyatnostnykh zakonov [Expansion of probabilistic laws], (RZHMat, 1973, 7V110).

Chapters I-V, VII-VIII study the same problems as in the earlier book of Yu. V. Linnik, much new material is included and the method used in a number of proofs is changed. Chapter VI contains general theorems on the expansions of multidimensional laws, as well as sufficient conditions for membership of n-dimensional limitlessly divisible laws in class I_{0n} (i. e., the class of n-dimensional laws not having unexpandable components).

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USSR

LINNIK, Yu. V., OSTROVSKIY, I. V., Razlozheniya sluchaynykh velichin i vektorov, Moscow, Nauka Press, 1972, 479 pages

The systematic study of the expansions of random vectors was begun basically in the 1960's and is fully reflected in this monograph for the first time. Chapter IX reflects the recently developed theory of V. M. Zolotarev of summation of independent random quantitites without conditions of limiting negligibility. Chapter X is dedicated to unsolved problems. The book includes four appendices, presenting special problems. The monograph is ended with a commentary on historical problems and references to the literature.

2/2

1/2 023 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--NATURE OF FALSE PEAKS IN A FARVITRON, IRON MASS ANALYSIS, SPECTRUM AND MEANS FOR ELIMINATING THEM -U-

AUTHOR-(04)-LINNIK, L.N., LOBACHEV, K.I., LINNIK, N.N., BATALOV, V.S.

COUNTRY OF INFO--USSR

SOURCE--PRIB. TEKH. EKSP. 1970, (2), 178-81.

DATE PUBLISHED-------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--SPECTRUM, ION, OSCILLATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

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2/2 023 UNCLASSIFIED PROCESSING DATE--04DEC70
CIRC ACCESSION NO--AP0136303
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. REASONS ARE GIVEN FOR THE OCCURRENCE OF FALSE, FRACTIONAL, AND MULTIPLE MASS PEAKS IN THE FARVITRON SPECTRUM. SOME MEASURES FOR PREVENTION OF FALSE PEAKS ARE DESCRIBED. BY USING THE RELATION BETWEEN THE AMPLITUDES OF THE SIGNALS OF THE MULTIPLE AND BASE MASS, IT IS POSSIBLE TO DET. THE COEFF. OF ION ESCAPE IN THE PROCESS OF OSCILLATION IN THE DRIFT SPACE.
FACILITY: NAUCH. ISSLED. EKSP. INST. PERERAB. KHIM. VOLOKON, USSR.

UNCLASSIFIED

USSR

UDC 621.378.32

LINNIK, V. P., Academician, BRYANSKAYA, G. M., and SAPOTNITSKAYA, E. A.

"Interferometer for the Study of Laser Wave Front"

Leningrad, Optiko-mekhanicheskaya promyshlennost' No 11, Nov 71, pp 27-29

Abstract: A modernized interferometer used for the study of laser emission wave front is described, and a schematic diagram of the experimental setup is presented. Investigation of the wave front was carried out on a glass 10 mm in diameter activated by neodium. A long focal length objective (F = 200 mm) disposed at double the focal length from the laser end, produced the image of this end in the plane of observation, while a mirror split the laser flash, directing half of it toward a short focal length objective (F = 30 mm), after which the spherical wave was recorded on the same photofilm. Thus a superposition of two waves occurred in the plane of observation, the one carrying the image of the laser end 10 mm in diameter, having the specific properties of the studied laser emission, the other a small section (1/6 of the diverging wave diameter), which in the first approximation can be considered as reference. The experimental technique is described in detail, and examples of interference bands of two lasers are

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LINNIK, V. P., et al., Optiko-mekhanicheskaya promyshlennost' No 11, Nov 71, pp 27-29

presented. Investigations carried out with this interferometer show that every laser has its own individual emission wave front, and that the interferometer may be used for studying wave fronts of lasers with various wave lengths.

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USSR

UDC 632.775

LINNIK, L. I., and LINNIK, V. T., Ukrainian Agricultural Academy

"Effectiveness of Several Preparations Against the Common Pear Sucker"

Moscow, Khimiya, v Sel'skom Khozyaystve, Vol 10 No 2 (100), 1972, pp 37-38

Abstract: The effectiveness of pesticides against the common pear (sucker Psylla pyricola) was studied in the irrigated pear orchard of the state farm technical school of the Crimean experimental horticulture station. The orchard is basically composed of Bero Bosk pear trees planted in 1932. The most effective preparations against the pear sucker were cidial in a 0.2 concentration, ultracide at 0.075%, fozalon at 0.3%, carbophos at 0.4%, and metaphos at 0.3%. The effectiveness of chlorophos was low. A single application of lindane was ineffective.

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USSR

UDC 632.934

LINNIK, L. I., LINNIK, V. T., Ukrainian Agricultural Academy

"Effectiveness of Organophosphorus, Organochlorine and Carbamate Preparations Against the Hawthorn Mite"

Moscow, Khimiya v sel'skom khozyaystve, No 11, 1971, pp 38-39

Abstract: A series of tests is described, conducted by the Crimean Experimental Station of Horticulture to determine the effectiveness of organophosphorus, organochlorine and carbamate acaricides. Tables are presented listing the individual compounds of each group in the order of effectiveness, concentration, initial pest population, reduced pest population after specific intervals. All organophosphorus compounds including Basudin and Endocid are shown to be of low toxicity. Of the organochlorine compounds, Kelthane appears to be most effective; Tedion and Rospin rank second in effectiveness. Mesurol, Acrex and MS-1945 of the carbamate group have shown high acaricidic activity.

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1/2 022 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--FORMATION OF TETRASODIUM TRITITANATE IN MIXTURES OF SODIUM CARBONATE AND TITANIUM DIOXIDE -U-

AUTHOR-(03)-BELYAYEV, E.K., PANASENKO, N.M., LINNIK, YE.V.

COUNTRY OF INFO--USSR

SOURCE--ZH. NEORG. KHIM. 1970, 15(3), 652-6

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CHEMICAL REACTION MECHANISM, X RAY ANALYSIS, SODIUM COMPOUND, CARBONATE, TITANATE, TITANIUM DIOXIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1994/1884 STEP NO--UR/0078/70/015/003/0652/0656

CIRC ACCESSION NO--AP0115703

UNCLASSIFIED

APPROVED FOR RELEASE: 09/19/2001 CIA-RDP86-00513R002201810014-2"

2/2 022 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0115703

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE INTERMEDIATE WHICH FORMS DURING A REACTION OF NA SUB2 CO SUB3 WITH TIO SUB2 AT A MOLE RATIO GREATER THAN 0.333 WAS STUDIED BY X RAY AND CHEM. ANALYSES. THE INTERMEDIATE IS 2NA SUB2 O.3TIO SUB2 (I) (BETA,TITANATE OR TETRA,NA TRI,TITANATE). THE MECHANISM OF THE REACTION OF NA SUB2 CO SUB3 WITH TIO SUB2 IN A 2:3 MOLE RATIO WAS STUDIED. THE REACTION GIVES I AND 4NA SUB2 O.5TIO SUB2 (II) AS PRODUCTS. I DISPROPORTIONATES TO II AND NA SUB2 O.3TIO SUB2.

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LINNIK, Yu. V.

"Recent Results from the Theory of Successive Estimation"

Mezhdunar. Kongress Matematikov v Nitstse 1970 [International Congress of Mathematicians in Nitstse, 1970 -- Collection of Works], Moscow, Nauka Press, 1972, pp 158-161 (Translated from Referativnyy Zhurnal, Kibernetika, No 3, Moscow, 1973, Abstract No 3 V189 by A. Kagan).

Translation: Certain results are listed from recent years, concerning successive estimation of parametric functions based on independent, identically distributed observations. In the asymptotic statement (meaning that the mean number of observations before stopping is great), the following results are noted: 1) when certain conditions of regularity are fulfilled, imposed on the distribution density of an individual observation, the successive procedure does not provide any significant gain (with quadratic loss) in comparison to the best estimate constructed from a sample of corresponding fixed volume; 2) when certain peculiarities of the distribution density are observed, the picture changes and the use of the successive procedure leads to a significant gain. In the precise statement, the results presented concern restoration of the successive plan S on the basis of the mean number $E_p\tau$ of observations as a function of parameter p, in the

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LINNIK, Yu. V., Mezhdunar. Kongress Matematikov v Nitstse 1970, Moscow, Nauka Press, 1972, pp 158-161.

plan of a standard binomial walk with parameter p, and other similar problems. In this connection, the following generalization is suggested for Bernstein polynomials:

$$B_f^S(\xi) = \sum_{(x,y)\in\partial S} K_{00}(x, y) f\left(\frac{K_{10}(x, y)}{K_{00}(x, y)}\right)\xi^x(1-\xi)^y,$$

where f is a continuous function, ∂S is the boundary of plan S, $K_{\alpha\beta}(x, y)$ is the number of trajectories of plan S leading from point (α, β) to point (x, y).

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USSR

LINNIK, Yu. V., Deceased, POMANOVSKIY, I. V.

"Properties of Minimum Plans of First Entry for Multinomial Processes"

Zap. Nauch. Seminarov Leningr. Otd. Mat. In-ta AN SSSR [Writings of Scientific Seminars Leningrad Division Mathematics Institute, Academy of Sciences, USSR], 1972, Vol 29, pp 3-8 (Translated from Referativnyy Zhurnal, Kibernetika, No 1, 1973, Abstract No 1 V267 by L. Gal'chuk).

Translation: A number of facts are proven concerning successive estimation of a vector parameter for a multinomial distribution. Namely, conditions are presented under which the stop boundary of observations is restored on the basis of the mathematical expectation of the moment of stopping, as well as the condition of completeness of plans of estimation.

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USSR

UDC 511

BREDIKHIN, B. M. and LINNIK, Yu. V. (Deceased)

"Using Theorems Involving Prime Numbers in Diophantine Problems of a Special Type"

Moscow, Matematicheskiye Zametki, Vol 12, No 3, September 1972, pp 243-250

Abstract: The purpose of this article is to demonstrate how the idea developed by I. M. Vinogradov (Izbrannyye trudy -- Selected Works -- Moscow, 1952) for solving difficult problems through the use of prime numbers can be applied to some special types of Diophantine problems with the assistance of the Cauchy-Bunyakovskiy inequality. The authors consider the equation

$$n = \frac{\nu_1 \varphi_1 - \nu_2 \varphi_2}{\nu_1 - \nu_2} \quad (\nu_1 \neq \nu_2):$$

where n is a specified natural number; ν_1, ν_2 are part of the increasing sequence of natural numbers (ν); and φ_1, φ_2 are part of the increasing sequence of natural numbers (φ), with φ_1 and φ_2 less than n. They prove that this equation can be solved and obtain a satisfactory evaluation of the number of solutions of the equation with limits on the density of the

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BREDIKHIN, B. M. and LINNIK, Yu. V. (Deceased), Matematicheskiye Zametki, Vol 12, No 3, September 1972, pp 243-250

ν numbers and on the distribution of the ϕ numbers in arithmetical progressions. Members of the Leningrad Division of the V. A. Steklov Mathematical Institute, they thank S. Utiyam for his comments.

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USSR

UDC 519.281

LINNIK, YU. V., Academician, RUKHIN, A. L.

"Convex Loss Functions in the Theory of Unbiased Estimates"

Moscow, Doklady Akademii Nauk SSSR, Matematika, Vol 198, No 3, 1971, pp 527-529

Abstract: The authors study unbiased estimates with minimal risk; i.e., the estimates f satisfying $E_\theta f(x)=g(\theta)$, where $\theta\in\Theta$ are abstract parameters and $g(\theta)$ is a real function. The estimates minimize the magnitude of the risk $R_\theta(f)=E_\theta W(f(x)-g(\theta))$, where W is any positive, convex loss function. The authors investigate the twice differentiable convex loss functions W(u) and W(0)=0. These satisfy the inequality $W(2u)\leq CW(u)$ (Δ_2-condition -- M. A. Krasnosel'skiy and Ya. B. Rutitskiy). It is known that in this instance $W(u)\leq C|u|^P$ and $|u|W'(u)\leq KW(u)$ when $K\leq 1$. It is shown that if f(x) is an unbiased estimate with minimal risk corresponding to the loss function $W(u)=u^2$, then f(x) under given conditions is also the unbiased estimate with minimal risk for the given loss function W. The proof is given. The results can be applied to the case of monotonic, convex loss functions. Orig. art.: ten formulas and six bibliographic entries.

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USSR

UDC 519.281

KLEBANOV, L. B., LINNIK, Yu. V., Academician, RUKHIN, A. L., Leningrad Department of the Mathematics Institute imeni V. A. Steklov, Academy of Sciences of the USSR; Leningrad State University imeni A. A. Zhdanov

"Unbiased Estimates and Matrix Loss Functions"

Moscow, DAN SSSR, Vol 200, No 5, Oct 71, pp 1024-1025

Abstract: Let $(\mathfrak{X}, \mathfrak{A}, P_\theta)$, $\theta \in \Theta$ be a probability space with a family of probability distributions on it. It is assumed that from the results of observations $x \in \mathfrak{X}$ conforming to one of the laws P_θ, an estimate must be made of the value of the given function $\gamma(\theta): \Theta \to \mathfrak{R}_m$, where $\mathfrak{R}_m$ designates the set of all square matrices of dimensionality $m \times m$ with real elements. If γ^* is assumed as an estimate of the unknown value $\gamma = \gamma(\theta)$, then losses are assigned by the matrix-value function $w(\gamma^*, \gamma) \in \mathfrak{R}_m$ assuming a relation of order in set $\mathfrak{R}_m$ generated by the positive definiteness of the matrix difference. The authors consider only functions $w(\gamma^*, \gamma)$ which are convex with respect to γ^* at each value of γ. If $g(x)$ is an estimate for $\gamma(\theta)$ i. e., a measurable mapping $\mathfrak{X} \to \mathfrak{R}_m$ then its risk, corresponding to the loss

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KLEBANOV, L. B. et al, DAN SSSR, Vol 200, No 5, Oct 71, pp 1024-1025

function $w(\gamma^*, \gamma)$, is

$$R_\theta(g) = E_\theta w(g(x), \gamma(\theta)).$$

The estimate $f(x)$ is said to be *better* than $g(x)$ if for all $\theta \in \Theta$ the matrix $R_\theta(g) - R_\theta(f)$ is nonnegatively defined, and *rigorously better* than $g(x)$ if the given matrix differs from the zero matrix for at least one θ. The estimate $f(x)$ belonging to some class K of estimates of the function $\gamma(\theta)$ is said to be *optimum in this class* if it is better than any estimate $g \in K$. The authors consider the class K of all unbiased estimates with finite covariation matrix: i. e., estimates $f(x)$ for which

$$E_\theta f(x) = \gamma(\theta), \quad E_\theta f(x) f^\tau(x) < \infty$$

for all $\theta \in \Theta$ (here τ designates the sign of transposition). The estimate $f(x)$ which is optimum in the given class K is called an *unbiased estimate with minimum risk*. The unbiased estimate with minimum risk corresponding to the measure of quality generated by the loss function

$$w_1(\gamma^*, \gamma) = (\gamma^* - \gamma)(\gamma^* - \gamma)^\tau$$

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KLEBANOV, L. B. et al, DAN SSSR, Vol 200, No 5, Oct 71, pp 1024-1025

(covariation matrix) is said to be an *unbiased estimate with minimum covariation matrix*. The authors investigate the interrelation between unbiased estimates with minimum covariation matrix and those with minimum risk corresponding to the given loss functions $w(\gamma', \gamma)$. Bibliography of five titles.

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USSR

UDC: 519.24

LEBEDEV, N. A., LINNIK, Yu. V., RUKHIN, A. L.

"Monotonic Convex Matrix Functions of Losses in Statistics"

Tr. Mat. in-ta AN SSSR (Works of the Mathematics Institute of the Academy of Sciences of the USSR), 1971, 112, ch. 1, pp 291-299 (from RZh-Kibernetika, No 12, Dec 71, Abstract No 12V328)

Translation: The form of monotonic and convex matrix functions is determined, and some of their uses as loss functions in mathematical statistics are indicated. Authors' abstract.

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USSR UDC: 519.24

LINNIK, Yu. V.

"On One Application of the Theory of Algebraic Numbers to Mathematical Statistics"

Tr. Mat. in-ta AN SSSR (Works of the Mathematics Institute of the Academy of Sciences of the USSR), 1971, 112, ch. 1, pp 22-29 (from RZh-Kibernetika, No 12, Dec 71, Abstract No 12V271)

Translation: Elements of the theory of algebraic numbers are applied for using properties of a normal law which consist in the integrality of its moments, and considerations from algebraic geometry are used for studying phenomena of independence of polynomial statistics. Author's abstract.

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USSR UDC 519.24

LINNIK, Yu. V., RUKHIN, A. L., STRELITS, Sh. I.

"Gamma Distribution and Partial Sufficiency of Polynomials"

Tr. Mat. In-ta. AN SSSR [Works of Mathematics Institute, Academy of Sciences, USSR], Vol 111, 1970, pp 40-51, (Translated from Referativnyy Zhurnal, Kibernetika, No 6, 1971, Abstract No 6 V137 by the authors).

Translation: A characteristic property of the gamma distribution is noted, consisting of independence of the quantity

$$E_\sigma\left\{P\left(\frac{x_1}{\sum x_j},\ldots,\frac{x_n}{\sum x_j}\right)\middle|\sum x_j\right\},$$

where $x_1, \ldots, x_n$ is a repeated sample from the general set with unknown scale parameter σ, while P is a certain polynomial from σ. This property allows statistical interpretation in terms of partial sufficiency of the statistics $\sum_1^n x_j$ for the scale parameter σ. The proof is based on determination of the positively defined solutions of equation

$$\sum_{p=1}^{k}\sum_{l_1+\ldots+l_p=s} A_{l_1,\ldots,l_p} y^{(l_1)}\ldots y^{(l_p)} y^{k-p}=0,$$

UDC 519.24

USSR

LINNIK, Yu. V., RUKHIN, A. L., STRELITS, Sh. I., Tr. Mat. In-ta. AN SSSR, Vol 111, 1970, pp 40-51.

to which the condition of independence from σ of this arbitrary mathematical expectation is reduced.

USSR

UDC: 519.281

KAGAN, A. M., LINNIK, Yu. V., Academician, ROMANOVSKIY, I. V., and RUKHIN, A. L.

"Sets With 'Self-Control'"

Moscow, Doklady Akademii Nauk SSSR, vol. 199, No. 4, 1971, pp 766-769

Abstract: In this investigation of the "self-control" of sets in the problem of successive evaluation of shift parameters in arbitrary loss functions, the parameter $\theta \in R^1$ in a standard system of direct measurements $x_i = \theta + \varepsilon_i$, $i = 1, 2, \ldots$, is considered, where the measurement errors ε_i are assumed to be random quantities with fully known distribution functions $F(x)$. The purpose of this article is thus to study successive estimation of the shift parameter θ in specified independent observations $x_1, x_2, \ldots$, distributed in accordance with the law $F(x - \theta)$. A formula is derived for the optimal invariant evaluate $\hat{\theta}$ of the parameter θ, and a theorem involving the errors ε_i subjected to hypernormal distribution and the derived formula is stated and proved. The authors are connected with the Leningrad Division of the V. A. Steklov Mathematical Institute.

1/1

USSR

LINNIK, Yu. V., RUKHIN, A. L., and STRELITS, Sh. I.

"Gamma Distribution and Partial Sufficiency of Polynomials"

Leningrad, Trudy Matematicheskogo Instituta im. Steklova; CXI: Teoreticheskiye Zadachi Matematicheskoy Statistiki, 1970, pp 40-51

Abstract: The article concerns repeated samplings of a given population of positive random quantities and the properties of partial sufficiency of linear statistics with respect to polynomials in percentages (in particular, properties of the stability of regression) and certain other statistics. The authors derive nonlinear differential equations which are studied by means of new results of Sh. I. Strelits on the asymptotic behavior of solutions of nonlinear differential equations. A new characterization of gamma distributions is obtained on the basis of this method.

The following theorem is proven:

"Let $F^{n*}(x)$ be the nth power of the convolution $F(x)$, absolutely continuous, and $\int_0^\infty x^k dF(x) < \infty$. Further, let $H_n\left\{p_k\left(\frac{x_1}{\sum x_j}, \ldots, \frac{x_n}{\sum x_j}\right) \Big/ \sum_1^n x_j\right\}$ not depend on 6

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USSR

LINNIK, Yu. V., et al, Trudy Matematicheskogo Instituta im. Steklova; CXI: Teoreticheskiye Zadachi Matematicheskoy Statistiki, 1970, pp 40-51

for some polynomial P_k of power $k < n$, such that the condition

$$F'(x) = A_0 x^{\rho-1} + A_1 x^{\rho} + \ldots + (A_8 + 0(1)) \quad \text{[remainder illegible]} \tag{1}$$

is satisfied. If at least one of the following conditions is satisfied, then F(x) is a distribution function of the gamma distribution:

(a) the function $x^{-\rho} + x^{-\rho+1}$ — where ρ is defined in equation (1) -- is not a solution of the equation

$$\sum_{p=1}^{k} \sum_{i_1+\ldots+i_p=k} A_{i_1,\ldots,i_p} y^{(i_1)} \ldots y^{(i_p)} y^{k-p} = 0, \quad n > k > 2, \tag{2}$$

and the equation

$$\sum_{\substack{i_1+\ldots+i_p=k \\ 1 \le p \le k}} A_{i_1,\ldots,i_p} \left\{ \sum_{q=1}^{p} \prod_{\substack{j=1 \\ j \ne q}}^{p} \frac{\Gamma(\rho+i_q)\,\Gamma(\rho+\mu+i_q)}{\Gamma(\rho)\,\Gamma(\rho+\mu)} - p \right\} \prod_{j=1}^{p} \frac{\Gamma(\rho+i_j)}{\Gamma(\rho)} = 0 \tag{3}$$

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USSR

LINNIK, Yu. V., et al, Trudy Matematicheskogo Instituta im. Steklova; CXI: Teoreticheskiye Zadachi Matematicheskoy Statistiki, 1970, pp 40-51

has no positive integral roots;

(b) $z^{-\rho}+z^{-\rho-1}$ is not a solution of equation (2), but equation (3) has positive roots $s_1, s_2, \dots s_\nu$ and coefficients with numbers $s_1, \dots, s_\nu$ of the polynomial $A_0 z^{-\rho}+\sum_{j=1}^{s_1} B_j z^{-(\rho+j)}$, where $B_j = A_j \Gamma(\rho+j)$ and the A_j defined in equation (1) coincide with the corresponding coefficients of the z^{-1}-degree series expansion of the function $A_0\left(z-\frac{B_1}{A_0\rho}\right)^{-\rho}$;

(c) $z^{-\rho}+z^{-\rho-1}$ is a solution of equation (2), the remaining conditions of (b) are satisfied, and, in addition, $B_2 = \frac{\rho+1}{2}\cdot\frac{B_1^2}{A_0}$.

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USSR

UDC 519.21

LINNIK, Yu. V.

"Theory of Probabilities and Mathematical Statistics"

Matematika v Peterburg.-Leningr. Un-te. [Mathematics in the Peterburg-Leningrad University -- Collection of Works], Leningrad, Leningrad University Press, 1970, pp 243-255 (Translated from Referativnyy Zhurnal Kibernetika, No 4, April, 1971, Abstract No 4 V1).

Translation: A brief historical review providing an idea of the primary results produced by the scientists of the Peterburg-Leningrad University in the area of the theory of probabilities and mathematical statistics.

1/1

USSR

UDC 519.281

LINNIK, Yu. V., (Academician) and ROMANOVSKIY, I. V., Leningrad Section of the Mathematical Institute imeni V. A. Steklov, Academy of Sciences USSR)

"On the Theory of Sequential Valuations"

Moscow, Doklady Akademii Nauk SSSR (Proceedings of the Academy of Sciences USSR), Vol 194, No 2, 1970, pp 270-272

Abstract: This is related to a previous paper and relies on the work of I. A. Ibragimov and R. Z. Khas'min. The authors stress the asymptotic and point aspects of sequential valuations in probability theory, using a non-Bayesian approach. Ibragimov and Khas'min set the condition that informational quantities are continuous for $n \leq 20$ (the I-K condition) and show the asymptotic behavior of the dispersion of the Pitman evaluation $\tilde{\theta}_n$ for parameter θ. The authors seek an optimum strategy for the sequential evaluation of $S = (\tau, T_\tau)$ as a pair consisting of a Markov moment τ and statistics T_τ, evaluating the given function $g(\theta)$.

An asymptotically optimal plan S is sought that minimizes $E_\theta (T_\tau - g(\theta))^2$ under the condition $E_\theta \tau \leq n$, where n is a given positive number. Theorems 1/2

USSR

LINNIK, Yu. V. and ROMANOVSKIY, I. V., Doklady Akademii Nauk SSSR (Proceedings of the Academy of Sciences USSR), Vol 194, No 2, 1970, pp 270-272

are given that show only infinitely small improvements can be gained in the mean square deviation using sequential analysis as compared to the method of constant volume sampling. The asymptotic results are applicable to homogeneous processes with independent increments and continuous time.

Orig. art. has 10 refs.

2/2

USSR

UDC 519.2

LINNIK, Yu. V.

"Remarks Concerning the Rao-Kramer and Bhattachargya Inequalities from the Theory of Statistical Valuation"

Moscow, Matematicheskiye Zametiki, Vol 8, July 1970, pp 3-7

Abstract: In 1946 the Rao-Kramer inequalities were generalized by Bhattachargya. In the present paper some correlaries of these inequalities are derived. The necessary explicit conditions for attaining possible boundaries of these inequalities by means of functions of the parameter are indicated.

1/1

USSR

UDC: 519.2

KAGAN, A. M., LINNIK, Yu. V., RAO, S. R.

"Characterization Problems of Mathematical Statistics"

Kharakterizatsionnyye zadachi matematicheskoy statistiki (cf. English above), Moscow, "Nauka", 1971, 656 pp, ill. 2 r. 50 k. (from RZh-Kibernetika, No 8, Aug 72, Abstract No 8V224 K)

[No abstract]

1/1

USSR

Microbiology

UDC 616.981.553-036.21(476)

POLESHKO, D. V., DOLBIK, M. I., NOVIKOV, P. L., and LINNIKOVA, G. D., Chair of Infectious Diseases, Minsk Medical Institute, and Minsk Municipal Hospital for Infectious Diseases

"Clinical and Epidemiological Data on Botulism in Belorussia"

Moscow, Sovetskaya Meditsina, Vol 33, No 7, Jul 70, pp 137-139

Abstract: During the last 4 years, 30 persons suffering from botulism have been treated at the Minsk Municipal Hospital; 26 of these patients had become ill after ingestion of domestically prepared mushrooms. All of the cases were caused by Type B Clostridium botulinus. The most pronounced symptoms were ophthalmic and pharyngeal paresis, with ensuing disturbed vision and severe dryness of the mouth. Gastrointestinal disorders developed in 17 cases. Cardiac complications were observed in patients suffering from the moderate and severe forms of the disease. No significant hematological changes were found. Administration of antibotulinas sera and penicillin was effective. To prevent botulism, mushrooms must be thoroughly cleaned to remove soil particles. They should also be properly sterilized. For marinated stocks, adequate amounts of preservatives must be added.

1/1

1/2 022 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--MOLAR VOLUMES OF GAS SOLUTIONS ALONG THE SATURATION LINE -U-

AUTHOR-(03)-LINSHITS, L.R., RUDKINA, I.B., TSIKLIS, D.S.

COUNTRY OF INFO--USSR

SOURCE--ZH. FIZ. KHIM. 1970, 44(3), 817-19

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--SOLUBILITY, AMMONIA, GAS STATE, NITROGEN, HYDROGEN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/1703 STEP NO--UR/0076/70/044/003/0817/0819

CIRC ACCESSION NO--AP0125324

UNCLASSIFIED

2/2 022 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0125324

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE SOLY. OF NH SUB3 IN COMPRESSED N-H MIXTS. CONTG. AR AND CH SUB4 WAS DETD. MOLAR VOLS. OF THE GASEOUS MIXT. OF CONST. CONPN. (20.6, H 61.8, AR 11.0, AND CH SUB4 6.6 MOLE PERCENT) WERE MEASURED AT 0, 10, 25, 50, 75, AND 100DEGREES AND AT PRESSURES OF 50-550 ATM. EXPTL. DATA THUS OBTAINED WERE PLOTTED IN THE COORDIANTES PV SV. P, WHERE P IS PRESSURE AND V IS MOLAR VOL., AND EXTRAPOLATED TO THE SATN. LINE. THE MOLAR VOLS. OF THE STUDIED GASEOUS MIXT. ALONG THE SATN. LINE WERE ASCERTAINED FROM THE PV VALUES CORRESPONDING TO THE SATN. PRESSURE AND ARE TABULATED FOR ALL THE STUDIED TEMPS. AT THE VARIOUS CONCN. OF NH SUB3 IN GASEOUS PHASE. FACILITY: GOS. INST. AZOT. PROM. PROD. ORG. SIN., MOSCOW, USSR.

UNCLASSIFIED

USSR

LINYUCHEV, N. M., et al., Gigiyena Sanitariya, No 10, 1972, pp 106-107

activity of the chlorophos was studied. Peroral administration of chlorophos in a dose of 455 mg/kg (LD_{16}) in mice treated with phenobarbital causes an expressed decrease in the degree of suppression of the cholinesterase activity of the brain. Whereas in the control mice the residual activity of the brain cholinesterase was 24.5%, against the phenobarbital background it was 42%. Phenobarbital does not decrease the anticholinesterase activity of the chlorophos in the blood. The data agree with the opinion of Arthur and Casida [J. Agricult. Food Chem., Vol 5, 186, 1957] that preliminary treatment with phenobarbital raises the resistance of experimental animals to the toxic effect of chlorophos by accelerating the enzymic hydrolysis of the poison in the liver with the formation of nontoxic products.

2/2

UDC 615.214.24:547.854.5].015.2:615.285.7

USSR

LINYUCHEV, N. M., MIMA, YU. P., SERGEYEV, V. V., Military Medical Academy imeni S. M. Kirov, Leningrad

"Effect of Phenobarbital on Toxicity and Anticholinesterase Activity of Chlorophos"

Moscow, Gigiyena Sanitariya, No 10, 1972, pp 106-107

Abstract: A study was made of the role of the liver of experimental animals in the detoxication of chlorophos and the effect ofactivity stimulators (phenobarbital) of the microsomal enzymes of the liver on its toxicity and anticholinesterase activity. Two series of experiments were performed on white male mice weighing 18-22 grams. In the first series of experiments a study was made of the effect of the phenobarbital on the resistance of the mice to the toxic effect of chlorophos on intraperitoneal and peroral administration of it. The difference in LD_{50} ratios for the experimental and control mice in both cases offers the possibility of proposing that the chlorophos in the liver is converted to a less toxic compound, and stimulation of the enzyme systems of the liver microsomes by phenobarbital causes a significant increase in resistance of the experimental animals to the chlorophos. In the second series of experiments performed with three groups of mice under analogous conditions, the effect of the phenobarbital on the anticholinesterase

1/2

(5)

UDC 577.158.347.01.04

EFFECT OF FREON-114B2 ON THE ACTIVITY OF ISOENZYMES OF LACTATE DEHYDROGENASE

[Article by L. A. Tiunov, V. A. Voronin, A. A. Deninenko, L. A. Linyucheva, and T. G. Kolosova; Moscow, Kosmicheskaya Biologiya i Meditsina, Russian, Vol 6, No 5, September-October 1972, pp 87-89, submitted for publication 16 December 1971]

The literature contains information on the possibility of atmospheric contamination of closed spaces by chemical substances emanating from mechanisms, technical apparatus and different systems (Klemedson; V. V. Kustov and L. A. Tiunov; Slager). In particular, the attention of researchers has been drawn to the study of freons. For example, the presence of freon-114B2 in the air of American spaceships has been noted by Wessel, Stanmeyer, Anderson and Sanders. It is emphasized that upon contact with heated surfaces the freons decompose, forming hydrogen chloride and fluoride and traces of phosgene (S. A. Tsirel'son and M. A. Razran; Wessel). Accordingly, study of the biological effect of freon-114B2 and the products of its decomposition is a timely problem.

The toxic effect of freon-114B2 has been studied by B. D. Karpov, A. I. Korbakova, et al. A relatively low toxicity, presence of a narcotic effect, and danger of products of pyrolytic decomposition have been noted (Howcett). Taking into account that the narcotic effect is accompanied by hypoxia and accumulation of lactic acid in cerebral tissues (A. V. Palladin and B. I. Khaykina), in the case of intoxication by freon-114B2 one can expect changes in lactate dehydrogenase activity, since an excess of the substrate exerts a considerable inhibiting effect on this enzyme (Kubowitz and Ott; Ottolenghi and Denstedt).

A change in lactate dehydrogenase activity was registered in intoxications by carbon monoxide (L. A. Tiunov and V. V. Kustov; Pecorn, et al.) and lead (Quatrini and Caiola). A change in the isoenzymes of lactate dehydrogenase has been described during hypoxia caused by an oxygen shortage (Yu. A. Yurrov) and in poisoning by styrene (Klein, et al.).

LINYUCHEVA, L. A

JPRS 57517
15 Nov 72

Acc. Nr AP0032549 Abstracting Service: CHEMICAL ABST. 3-70 Ref. Code NE0000

55601p Reactions of bis(triphenylgermyl)cadmium with protic reagents. Vyazankin, N. S.; Bychkov, V. T.; Lapina, O. V.; Razuvaev, G. A. (Polym. Stabil. Lab., Gorki, USSR). *J. Organometal. Chem.* 1970, 21(1), 107–13 (Eng). Reactions of bis(triphenylgermyl)cadmium with H_2O, EtOH, PhOH and carboxylic acids occur with heterolytic cleavage of one of the germanium–cadmium bonds. $Ph_3GeCdOR$ (R = H, Et, Ph, Ac, CF_3CO, Bz), are formed as the final or intermediate products. In the latter case they decomp. to cadmium and Ph_3GeOR or react immediately with protic reagents with scission of the Ge–Cd bond. Some complexes of bis(triphenylgermyl)cadmium, and related compds., with electron donors were investigated. RCLC

REEL/FRAME

19700836

UDC 678.632'32'21.01:53

USSR

MACHULIS, A. N., MISEVICHYUS, P. P., ANDRONAVICHENE, L. P., [redacted], and REMLIN, A. A.

"The Effect of Stabilization and Thermal Treatment on the Ablation of Phenol-Formaldehyde Plastics"

Moscow, Plasticheskiye Massy, No 3, 1972, pp 53-56

Abstract: A study of the ablation stability and breakdown of phenolformaldehyde plastics (PFP) stabilized with polymers with a system of conjugated bonds (-CH=) was carried out. The effect of preliminary thermal treatment of a stabilized phenol-formaldehyde resin on its physical-mechanical and ablation properties was also investigated. The following stabilizers were used: polyparaphenylene, polyphenylenequinone, polymetaphenylenequinone, polyphenylanthraquinone, polyquinone dioxine, and a polymer of m-phenylenediamine and bis-diaminodiphenyl benzidine. In general, the stabilized PFP showed lower weight loss and fewer macrodefects of the structure than the nonstabilized ones. The kinetics of ablation breakdown of both the stabilized and starting PFP, on the other hand, appeared to be identical. In an inert medium the ablation breakdown of PFP is slower than in an oxidizing medium, but the effectiveness of stabilizing additives is also lower. Thermal treatment of stabilized PFP powders is effective only to 200°C in increasing the strength and ablation stability of PFP

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USSR

MACHYULIS, A. N., et al., Plasticheskiye Massy, No 3, 1972, pp 53-56

stabilized with PCB. Higher temperatures lead to formation of cracks, weight loss and poorer physical-mechanical properties.

2/2

Polymers and Polymerization

UDC 541(64+67):678.76

USSR

MATNISHYAN, A. A., ZELENETSKIY, A. N., LIOGON'KIY, B. I., and BERLIN, A. A.

"Determination of Redox Potentials of Electron Exchange Polymers With a Conjugation System"

Moscow, Vysokomolekulyarnyye Soyedineniya, Vol 13, No 5, May 71, pp 1170-1175

Abstract: An equilibrium method for determining redox potentials of insoluble, slightly swelling compounds (those unstable towards oxidizing agents, as well as compounds with low redox potentials) has been developed. The method is based on the calculation of the potential of a redox pair in equilibrium with the studied system. When two redox systems interact, an equilibrium will set up between them after some time, when $E_1 = E_2$. From the Nernst equation and above condition the formula was developed for calculation of the unknown E_o^2

$$E_{o2} = E_{o1} + \left[\frac{RT}{F} \ln \left(\frac{[O_1]}{[R_1]}\right)^{1/n_1} \left(\frac{[R_2]}{[O_2]}\right)^{1/n_2}\right]$$

1/2

USSR

MATNISHYAN, A. A., et al., Vysokomolekulyarnyye Soyedineniya, Vol 13, No 5, May 71, pp 1170-1175

where $[O_1]$, $[R_1]$ are the concentrations of the oxidized and reduced forms of the soluble system, and $[O_2]$, $[R_2]$ -- of the insoluble system (test system), and n is the number of electrochemical equivalents. Using this formula, the normal redox potentials of polyphenylenequinone, polyphenylenehaloquinone, polyphenylenesulfoquinone, indigo, thioindigo, and polythioindigo were determined for the first time.

2/2

Acc. Nr AP0048826 Abstracting Service: CHEMICAL ABST. 5-72 Ref. Code UR0459

90938a **Electrical conductivity of polyquinones and its dependence on the chemical structure of the polymer molecules.** Dulov, A. A.; Gurov, A. A.; Liogon'kii, B. I.; Berlin, A. A. (Inst. Khim. Fiz., Moscow, USSR). *Vysokomol. Soedin., Ser. A* 1970, 12(1), 74-80 (Russ). The elec. cond. of poly(quinone oxide) (I), poly(quinonedioxin) (II), poly(quinonethioxin) (III), poly(quinoneamine) (IV), poly(quinonethiazine) (V), poly(quinonequinonediimine) (VI), poly(quinononaphthoquinone - 1,4-diimine) (VII), and poly(quinonephenodithiazine) (VIII) was measured at 20–200°/10^{-5} mm. Introduction of O bridges (and to a lesser extent NH groups) led to a marked decline in elec. cond. A transition to ladderlike polymers was accompanied by an increase in elec. cond.; the increase was most significant in VI vs. VIII. The activation energy increased and the sp. elec. cond. decreased on transition from the oxidized to the hydroquinone form. Ladderlike polymers contained a higher concn. of unpaired spins, suggesting that introduction of O bridges hindered the formation of paramagnetic centers considerably stronger than either -S- or NH-. CKJR

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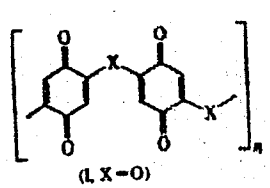
REEL/FRAME
19800589

AP0048826



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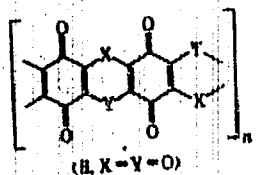
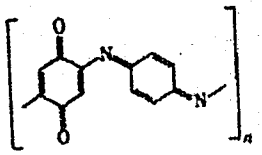
(IV, X = NH)



(II, X = Y = O)
(III, X = O, Y = S)
(V, X = NH, Y = S)



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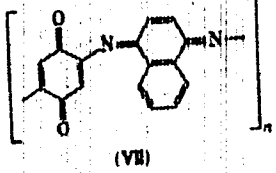
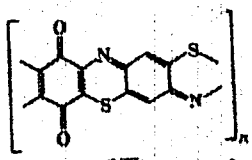


(VII)



(VIII)

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19800590

1/2 070 UNCLASSIFIED PROCESSING DATE--09OCT70

TITLE--THERMAL TRANSFORMATIONS OF SOME AROMATIC POLYAMIDO AND POLYAMINOAMIDO ACIDS -U-

AUTHOR-(04)-SHAMRAYEV, G.M., DULOV, A.A., LIOGONKIY, B.I., BERLIN, A.A.

COUNTRY OF INFO--USSR

SOURCE--VYSOKOMOL. SOEDIN., SER. A 1970, 12(2), 401-8

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--PYROLYSIS, POLYMER, BENZIMIDAZOLE, IR SPECTRUM, EPR SPECTRUM, X RAY DIFFRACTION, ELECTRON MICROSCOPY, CONJUGATED POLYMER, THERMAL DEGRADATION, HIGH TEMPERATURE MATERIAL, HETEROCYCLIC NITROGEN COMPOUND, POLYNUCLEAR HYDROCARBON

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1992/0763 STEP NO--UR/0459/70/012/002/0401/0408

CIRC ACCESSION NO--AP0111955
UNCLASSIFIED

2/2 070 UNCLASSIFIED PROCESSING DATE--090CT70

CIRC ACCESSION NO--AP0111955

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECTS OF PYROLYSIS TEMP. WAS STUDIED ON I (R IS A DIRECT BOND, O, CH SUB2, OR POLY(NAPHTHOYLENEBISBENZIMIDAZOLE)) OR II (R IS A DIRECT BOND OR O), THE PREPN. OF WHICH WAS REPORTED BY A. A. BERLIN, ET AL. (1966-8). IR SPECTROSCOPY, X RAY DIFFRACTION, ELECTRON MICROSCOPY, AND EPR SPECTROSCOPY WERE USED TO ESTABLISH THAT THE ORDERING OF I OR II PROCEEDS AT SMALLER THAN OR EQUAL TO 400DEGREES. THIS IS DUE TO FORMATION OF THE CONJUGATED HETEROCYCLIC POLYMERS, SUCH AS III OR IV. AT 500DEGREES AND SMALLER THAN OR EQUAL TO 800DEGREES, THE STRUCTURE ORDERING OF III AND IV DECREASES OWING TO THERMAL DEGRADATION.

FACILITY: INST. KHIM. FIX., MOSCOW, USSR.

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--04DEC70

1/2 030

TITLE--DEHYDROGENATION AND CROSSLINKING OF SATURATED POLYMERS -U-

AUTHOR-(04)-BERLIN, A.A., LIOGONKIY, B.I., HATNISHYAN, A.A., MUSOELYAN, I.N.

COUNTRY OF INFO--USSR

SOURCE--U.S.S.R. 265,438

REFERENCE--OTKRYTIYA, IZOBRET., PROM. OBRAZTSY, TOVARNYE ZNAKI 1970,

DATE PUBLISHED--09MAR70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ELECTRON ACCEPTOR, CHEMICAL PATENT, POLYMER, DEHYDROGENATION, POLYMER CROSSLINKING, QUINONE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--3007/1764 STEP NO--UR/0482/70/000/000/0000/0000

CIRC ACCESSION NO--AA0137004

UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--04DEC70

2/2 030

CIRC ACCESSION NO--AA0137004

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SATD. POLYMERS ARE DEHYDROGENATED AND CROSSLINKED WITH QUINONES TO WHICH HAVE BEEN ADDED A SUBSTANCE THAT IS A STRONGER ELECTRON ACCEPTOR THAN THE CORRESPONDING QUINONE, SUCH AS TETRACYANOBENZENE, TETRACYANOETHYLENE, DINITROPHENOL, A HALOSUBSTITUTED QUINONE, AND K BICHROMATE. FACILITY: INSTITUT KHIMICHESKOY FIZIKI AN SSSR.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--SYNTHESIS AND STUDIES OF SOME POLYAMINO ACIDS -U-

AUTHOR-(03)-BERLIN, A.A., LIOGONKIY, B.I., SHAMRAYEV, G.M.

COUNTRY OF INFO--USSR

SOURCE--VYSOKOMOL. SOEDIN., SER. A 1970, 12(4), 938-47

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--ORGANIC SYNTHESIS, POLYCONDENSATION, NAPHTHALENE, CARBOXYLIC ACID, ANHYDRIDE, AMINE, BENZENE DERIVATIVE, POLYAMIDE COMPOUND, PLASTIC FILM, HETEROCYCLIC NITROGEN COMPOUND, POLYNUCLEAR HYDROCARBON

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3006/1494 STEP NO--UR/0459/70/012/004/0938/0947

CIRC ACCESSION NO--AP0135155
UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--27NOV70

2/2 017

CIRC ACCESSION NO--AP0135155

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE POLYCONDENSATION OF 1,4,5,8,NAPHTHALENETETRACARBOXYLIC ACID DIANHYDRIDE (I) WITH 3,3 PRIME,DIAMINOBENZIDENE, 3,3 PRIME, 4,4 PRIME TETRAAMINODIPHENYLMETHANE, OR 3,3 PRIME, 4, 4 PRIME,TETRAAMINODIPHENYL ETHER IN APROTIC SOLVENTS GAVE THE CORRESPONDING POLYAMIDES. THE HIGHEST VISCOSITY OF THE REACTION MIXT. WAS OBTAINED WHEN 1-2PERCENT I EXCESS WAS USED TO MAKE UP FOR I HYDROLYZED TO THE TETRACARBOXYLIC ACID. THE EVAPN. OF THE SOLNS. GAVE POLYAMIDE FILMS, WHICH ON HEATING IN VACUO 2 HR AT 300DEGREES GAVE II (R IS ABSENT, O, OR CH SUB2). FACILITY: INST. KHIM. FIZ., MOSCOW, USSR.

UNCLASSIFIED

1/2 012 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--REACTION OF SURFACE ACTIVE AGENTS WITH COLLAGEN. 2. EFFECT OF TREATMENT WITH SOLUTIONS OF SURFACE ACTIVE AGENTS ON THE PROPERTIES OF

AUTHOR-(02)-DERBAREMDIKER, M.L., LIOKUMOVICH, R.B.

COUNTRY OF INFO--USSR

SOURCE--IZV. VYSSH. UCHEB. ZAVED., TEKHNOL. LEGK. PROM. 1970, (1), 78-82

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--SURFACE ACTIVE AGENT, PROTEIN, LEATHER, SULFONE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/0949 STEP NO--UR/0323/70/000/001/0078/0082

CIRC ACCESSION NO--AP0124609
UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--30OCT70

2/2 012

CIRC ACCESSION NO--AP0124609

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECTS OF TREATING SAMPLES OF ACETONEDRIED RAW HIDES AND SOFTENED HIDES WITH SOLNS. OF ALKYL, AND ALKYLARENESULFONATES WERE STUDIED BY DETN. OF THE FUSION TEMP. AND AMT. OF PROTEIN EXTD. AT LOW CONCNS. OF SURFACTANT, THE FUSION TEMP. REMAINED UNCHANGED, ALTHOUGH THE AMT. OF EXTD. PROTEIN INCREASED. THE REDN. OF FUSION TEMP. BEGAN AT A CERTAIN CRIT. SURFACTANT CONCN., AND THE REDN. INCREASED WITH INCREASE IN THE SURFACTANT CONCN. IT IS SUGGESTED THAT THE CRIT. CONCN. OF SURFACTANT AND THE RATE OF REDN. OF FUSION TEMP. WITH INCREASE IN CONCN. OF SURFACTANT COULD SERVE AS INDEXES FOR WORK IN THE LEATHER INDUSTRY CONNECTED WITH THE USE OF SURFACTANTS.

FACILITY: UKR. NAUCH.-ISSLED. INST. KOZH.-OBUV. PROM., USSR.

UNCLASSIFIED

USSR

UDC 551.586

[redacted] and TSITSENKO, G. V.

Klimaticheskiye Usloviya i Teplovoye Sostoyaniye Cheloveka (Climatic Conditions and Human Thermal State), Leningrad, Hydrometeorological Publishing House, 1971, 152 pp

Translation: Foreword: In recent years both in our country and abroad, research in the field of human biometeorology has significantly intensified. One of the central questions of biometeorology is studying the effect of meteorological factors on thermal balance and the human thermal condition. Such research involves significant difficulties; until recently it was not possible to make a full assessment of the effect of solar radiation on the human organism or to study the characteristics of the effect of the energy of solar radiation on the human body in different climatic regions. In addition, the human thermal state under natural conditions has hardly been investigated at all as a function of the entire range of meteorological factors, nature of clothing, and physical work. The necessity of considering these indicators arises from the practical tasks involved in creating effective means to protect human beings against unfavorable climatic conditions, when establishing norms for open-air labor, designing clothing and housing, evaluating climate from a hygienic point of view, and so on.

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USSR

LIOPO, T. N., and TSITSENKO, G. V., Klimaticheskiye Usloviya i Teplovoye Sostoyaniye Cheloveka, Hydrometeorological Publishing House, 1971, 152 pp

The physically substantiated method for calculating the thermal state of the human body proposed by M. I. Budyko makes it possible to unambiguously assess the effect of climatic conditions on the human thermal state. Such an evaluation of climate may be done in two ways:

1) with prescribed thermal insulation of clothing and meteorological factors, the basic, objective indicator of the thermal state -- the average temperature of the surface of the human body can be calculated;

2) with prescribed meteorological factors, that thermal insulation of clothing which ensures a certain thermal state can be calculated.

In their research, various authors use both of these possibilities. But when calculating the temperature of the body surface, especially for states which deviate substantially from comfortable parameters, physiological reactions may occur in the organism which are not considered by the thermal balance equation; in this case, an incorrect result may be obtained.

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USSR

LIOPO, T. N., and TSITSENKO, G. V., Klimaticheskiye Usloviya i Teplovoye Sostoyaniye Cheloveka, Hydrometeorological Publishing House, 1971, 152 pp

We used the thermal balance equation to calculate the thermal isolation of clothing which ensures thermal comfort, that is, the second way was employed. Under conditions of thermal comfort, physiological reactions occur with least strain and the equation which models the physiological process makes it possible to consider physiological parameters with great accuracy. It is not an accident that the best correspondence between calculated and experimentally determined values for thermal insulation of clothing are observed with this method.

Clothing which is designed with due regard for climatic characteristics makes it possible to expand the zone of thermal comfort, protects a person not only against cold, but against excessive overheating, and increases his work capacity. Such clothing is particularly essential in the mastering of new regions, where well-appointed housing does not appear immediately and the artificial microclimate which ensures a certain level of thermal state is created primarily by clothing. It is also necessary to consider that there are a large number of occupations (geologists, construction workers, hunters, military servicemen, and so on), which require that a person spend long periods out of doors.

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USSR

LIOPO, T. N., and TSITSENKO, G. V., Klimaticheskiye Usloviya i Teplovoye Sostoyaniye Cheloveka, Hydrometeorological Publishing House, 1971, 152 pp

We have determined the thermal protection qualities of clothing which are necessary to create a comfortable human thermal state for the entire territory of the Soviet Union. Despite the fact that these thermal protective properties of clothing were established using only many years of average monthly values (while probable fluctuations in meteorological factors during a certain period were not taken into account), these calculations may be used for the purposes of hygiene, construction, and so on.

Thermal insulation of clothing calculated according to average monthly values of meteorological factors is an important criterion for bioclimatic evaluation of the effect of climate on the human thermal state. A consideration of probable changes in the characteristics of climate is particularly significant for the territories of Siberia and the Far East, which are being extensively settled at the present time. It has turned out to be possible to solve this problem by using the methods of mathematical statistics. Statistical analysis has also made it possible to isolate the primary meteorological factors which affect the human thermal state, which made it possible to construct a nomogram for calculating the thermal insulation of clothing required to ensure thermal comfort.

USSR

LIOPO, T. N., and TSITSNEKO, G. V., Klimaticheskiye Usloviya i Teplovoye Sostoyaniye Cheloveka, Hydrometeorological Publishing House, 1971, 152 pp

Chapters 1, 2, 4, 5, 9, and 10 were written by G. V. Tsitsenko, while chapters 3, 6, 7, 8, and 11 are by T. N. Liopo.

The authors of the book are sincerely grateful to corresponding member of the Academy of Sciences USSR M. I. Budyko, Academician of the Academy of Sciences USSSR V. B. Sochava, senior scientific associate at the Main Geophysical Observatory imeni A. I. Voyeykov, N. A. Yefimova, and Candidate of Medical Sciences Ye. I. Ignat'yev for their great help in completing this work. In addition, we express our sincere thanks to Doctor of Geographical Sciences B. A. Ayzenshtat, reviewer and editor of the manuscript, for his valuable remarks.

Table of Contents:

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LIOPO, T. N., and TSITSNEKO, G. V., Klimaticheskiye Usloviya i Teplovoye Sostoyaniye Cheloveka, Hydrometeorological Publishing House, 1971, 152 pp

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LIOPO, T. N., and TSITSNEKO, G. V., Klimaticheskiye Usloviya i Teplovoye Sostoyaniye Cheloveka, Hydrometeorological Publishing House, 1971, 152 pp

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LIOPO, T. N., and TSITSNEKO, G. V., Klimaticheskiye Usloviya i Teplovoye Sostoyaniye Cheloveka, Hydrometeorological Publishing House, 1971, 152 pp

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USSR

UDC 547.241.07

RAZMOV, A. I., LIORBER, B. G., FOKOLOV, M. P., and KHAMMATOVA, V. M., Kazan Chemical Technological Institute imeni F. M. Kirova

"Process for the Preparation of Phosphorylated Thiosemicarbazones"

USSR Author's Certificate No 362022, filed 1 Mar 71, published 13 Dec 72 (from Otkrytiva, Izobreteniya, Promyshlennyye Obraztsy, Tovarnyye Znaki, No 2, 1973, p 54)

Translation: This process is improved in that the phosphorylated aldehydes react with the thiosemicarbazides in an organic solvent with a subsequent isolation of the desired product by a known method.

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UDC 547.341

USSR

RAZUMOV, A. I., SOKOLOV, M. P., LIORBER, B. G., MOSKVA, V. V., SAZONOVA, Z. YA., and LOGINOVA, N. G., Kazan' Chemical-Technological Institute Imeni S. M. Kirov

"Synthesis and Properties of Phosphorylated Imines and Enamines"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 5, May 73, pp 1019-1026

Abstract: Several methods exist for the synthesis of phosphorylated secondary and tertiary enamines and imines: direct reaction of primary amines with aldehydes, reaction of secondary enamines with phosphorylated aldehydes in presence of p-toluenesulfonic acid, reaction of the diamides of allylphosphorous acid with aldehydes, and transamination of enamines. Imine-enamine tautomerism of these products was studied showing that the position of tautomeric equilibrium depends principally on the nature of substituents at the nitrogen atom and on the type of solvent used. Hydrogen bonding of the enamine forms depends mainly on the substituents at nitrogen and phosphorus atoms and on the steric distribution of proton acceptors.

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USSR UDC 241.+ 547.26.118 + 547.281

RAZUMOV, A. I., LIORBER, B. G., MOSKVA, V. V., and SOKOLOV, N. P., Kazan' Chemical Technological Institute imeni S. M. Kirov

"Phosphorylated Aldehydes"

Moscow, Uspekhi Khimii, Vol 42, No 7, Jul 73, pp 1199-1224

Abstract: A review with 120 references reporting systematically analyzed data on the synthetic methods and chemical properties of phosphorylated aldehydes. Principal attention has been given to the analysis of the organophosphorus compounds containing a formyl group in the alkyl radical connected with the phosphorus atom by a C-P bond. The aldol-enol tautomerism of the phosphorylated aldehydes is discussed in detail, the effect of various factors on the position of aldo-enol equilibrium having been analyzed. The geometric structure of the enols formed is reported.

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UDC 547.241

USSR

RAZUMOV, A. I., LIORBER, B. G., SOKOLOV, M. P., MOSKVA, V. V., NAZVANOVA, G. F., ZYKOVA, T. V., CHEMODANOVA, L. A., and SALAKHUTDINOV, R. A., Kazan' Chemical-Technological Institute Imeni S. M. Kirov

"Reactivity and Structures of Phosphorylated Carbonyl Compounds. XI. Study of the Aldol-Enol Equilibrium of Phosphorylated Aldehydes as a Function of Temperature"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 3, Mar 73, pp 568-572

Abstract: The aldol-enol equilibrium of a series of alkyl substituted and non-substituted phosphorylated aldehydes has been investigated as a function of temperature using IR, NMR-^{1}H and NMR-^{31}P spectroscopical analyses. With increasing temperature the nonsubstituted compounds go from the trans-enol form through the aldol form into the cis-enol form. In case of the alkyl substituted phosphorylated aldehyde only the conversion from trans-enol form into the aldol form has been observed. Quantitative determination of the ratios of aldol to trans-enol form has been made.

USSR

UDC 547.241

RAZUMOV, A. I., SAVICHEVA, G. A., ZYKOVA, T. V., SOKOLOV, M. P., SMIRNOVA, G. G., LIORBER, B. G., SALAKHUTDINOV, R. A., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Reactivity and Structure of Phosphorylated Carbonyl Compounds. 8. NMR and IR Spectra of Arylalkoxyphosphinylacetaldehydes"

Leningrad, Zhurnal Obshchey Khimii, Vol 41, No 10, 1971, pp 2164-2167

Abstract: In a continuation of the previous study of dialkoxyphosphorylacetaldehydes, tautomerism in alkoxyarylphosphorylacetaldehydes (I) was studied on the theory that an aryl substituent at the P atom may affect the aldol-enol equilibrium. Measurements of the P-31 chemical shift in compounds I hinted at a shift in equilibrium toward the enol form. This was confirmed by NMR spectra of 20% I solutions in carbon tetrachloride: the NMR band of α-ethylenic proton revealed the presence of the enol form. The IR spectra of nondiluted I compounds indicated simultaneous existence of two enol forms: B with intermolecular and 1/2

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RAZUMOV, A. I., et al, Zhurnal Obshchey Khimii, Vol 41, No 10, 1971, pp 2164-2167

C with strong intramolecular hydrogen bonds in addition to aldol form. The IR spectra of 5-20% I solutions in carbon tetrachloride reflected a sequential shift toward the aldol form with increasing dilution, so that practically only the aldol form existed in the 5% solutions. The IR spectral data showed that in triethylamine solutions of I, in contrast to carbon tetrachloride solutions, the equilibrium shifts toward the B chelated enol form which incorporates triethylamine.

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USSR UDC 547.241+547.26'118

RAZUMOV, A. I., SAVICHEVA, G. A., ZYKOVA, T. V., SOKOLOV, M. P., LIORBER, B. G., and SALAKHUTDINOV, R. A., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Reactivity and Structure of Phosphorylated Carbonyl Compounds. Part VII. NMR and IR Spectra of Dialkoxyphosphonylacetaldehydes"

Leningrad, Zhurnal Obshchey Khimii, Sep 71, Vol 41, No 9, pp 1954-1957

Abstract: The considerable value of phosphorylated carbonyl compounds lies in the fact that they, like β-carbonyl compounds, exhibit keto-enolic tautomerism. The application of polarography and IR spectroscopy (in earlier studies) indicates that some β-phosphorylated aldehydes are mixtures of keto- and cis-enolic forms whose equilibrium depends on both the solvents and the pH of the aqueous solutions. This paper reports on tautomeric transformations of diethoxy- (I) and diisopropoxyphosphonylacetaldehydes (II) using NMR and IR spectroscopy. The tautomerism of both compounds was studied from the NMR spectra of (I) and its 5, 10 and 20% solutions in carbon tetrachloride, 30 and 50% solutions in triethylamine and from the NMR spectra of aldehyde (II) and its 10% solution in triethylamine at 20°C.

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RAZUMOV, A. I., et al., Zhurnal Obshchey Khimii, Sep 71, Vol 41, No 9, pp 1954-1957

Readings of the NMR spectra were made on a YaMR-5535 spectrometer, the P^{31} NMR spectra were read on the RYa-2303 spectrometer and the IR spectra were read on UR-10 and UR-20 units. Both NMR and IR spectra indicate that dialkoxyphosphenylacetaldehydes and their solutions in CCl_4 are an aldo- form with a small admixture of the enolic structure. In triethylamine, the chelated enolic structure is predominant.

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UDC 547.241

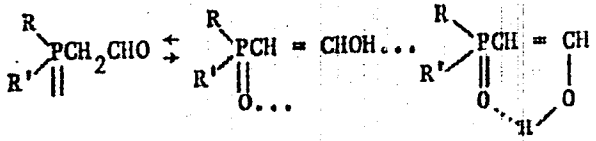
USSR

RAZUMOV, A. I., SOKOLOV, M. P., ZYKOVA, T. V., LIORBER, B. G., SAVICHEVA, G. A., SALAKHUTDINOV, R. A.

"Reactivity and Structure of Phosphorylated Carbonyl Compounds. IX. Ketoenol Equilibrium of Phosphorylated Acetaldehydes"

Leningrad, Zhurnal Obshchey Khimii, Vol XLII (CIV), No 1, 1972, pp 47-51

Abstract: Tautomeric conversions of dialkoxyphosphonyl and arylalkoxyphosphinyl acetaldehydes have been described previously (A. I. Razumov, et al., ZhOKh, No 41, 1954, 1971; No 41, 2164, 71]. The study of alkylalkoxyphosphinyl acetaldehydes from this point of view is a logical development of this pervious work. The methods of infrared and nuclear magnetic resonance ^{1}H and ^{31}P spectroscopy has been used to show that the ketoenol equilibrium of phosphorylated acetaldehydes



depends to a significant extent on the alkalinity of the P=O radical, spatial

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RAZUMOV, A. I., et al., Zhurnal Obshchey Khimii, Vol XLII (CIV), No 1, 1972, pp 47-51

effects and the effects of solvents. The calculated ketoenol equilibrium constants of both the undeveloped substances and 20, 10 and 5 percent molar solutions of them in carbon tetrachloride and the free energy ΔF are tabulated. In the aliphatic series, with an increase in the alkalinity, successive shifting of the equilibrium toward the enol form is observed. The values of ΔF found correlate satisfactorily with the Kabachnik constants [T. A. Mastryukova, M. I. Kabachnik, Usp. khim., No 38, 1751, 1969]. On dissolving the investigated substances in carbon tetrachloride (20, 10 and 5% molar solutions) a gradual shift in the aldo direction takes place.

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USSR

UDC 547.26'118

RAZUMOV, A. I., KRIVOSHEYEVA, I. A., LIORBER, B. G., TARZIVOLOVA, T. A., and PAVLOV, V. A., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Investigation in the Series of Phosphinic and Phosphinous Acid Derivatives. LXXXII. Kinetics of Hydrolysis of Diallylphosphinic Acid Esters"

Leningrad, Zhurnal Obshchey Khimii, Vol 42(104), No 3, Mar 72, pp 496-498

Abstract: Biologically active compounds have been found among the diallylphosphinic acid esters. The authors investigate the kinetics of uncatalyzed hydrolysis of these esters in an effort to determine the effect of the structure of the alkoxy radicals on their reactivity. Compounds of the $(CH_2=CHCH_2)_2P(O)OR$ type containing saturated radicals of normal and branched structure as well as unsaturated radicals with double and triple bonds in the ester group (R = CH_3, C_2H_5, n.-C_3H_7, iso-C_3H_7, C_4H_9, iso-C_4H_9, sec.-C_4H_9, $CH_2=CH$, $CH_2=CHCH_2$, $CH_3CH=CHCH_2$, $CH\equiv CCH_2$) were selected for study. The kinetics of hydrolysis were checked by titration. Preliminary experiments showed that diallylphosphinic acid and the corresponding alcohol formed during the reaction have no effect on the course of hydrolysis. Diallylphosphinic acid needed for the experiments was synthesized by treating diallylphosphinic

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RAZUMOV, A. I., et al., Zhurnal Obshchey Khimii, Vol 42(104), No 3, Mar 72, pp 496-498

acid chloride with equivalent quantities of water. The experimental data indicate that the hydrolysis of these esters takes place with splitting of the C-O bond. The monomolecular reaction is apparently the rate determining step for the reaction of the esters studied. The results of the work may be useful in studying the alkylating capacity of diallylphosphinic acid esters.

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USSR

UDC 547.341

RAZUMOV, A. I., LIORBER, B. G., SOKOLOV, M. P., and ZYKOVA, T. V., Kazan' Institute of Chemical Technology imeni S. M. Kirov

"Reaction of Phosphorylated Acetaldehydes With Allyl Phosphonous Acid Diamides"

Leningrad, Zhurnal Obshchey Khimii, Sep 71, Vol 41, No 9, pp 2106-2107

Abstract: Studies on the conversion of phosphorylated aldehydes indicate that in reactions with allyl phosphonous acid diamides they yield enamines. It is assumed that the reaction passes through the enolic form since the presence of basic agents (in this case allyl phosphinous acid diamides) moves the keto-enol equilibrium of the phosphorylated acetaldehydes toward the enol forms. The structure of the synthesized compounds is supported by both IR and PMR spectra. They show absorption bands at 1616 cm^{-1} ($\nu C=C$), 1227 cm^{-1} ($\nu P=O$), 1170 and 1030 cm^{-1} ($\nu P-O-C_2H_5$). The NMR spectra show peaks for CH_3, CH_2 and OCH_2.

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USSR

UDC 547.341

RAZUMOV, A. I., LIORBER, B. G., SOKOLOV, M. P. Kazan Chemical-Technological Institute imeni S. M. Kurov

"Study of a Series of Derivatives of Phosphonic and Phosphonous Acids" LXVIII. The Diamides of Allylphosphinous Acids, Their Synthesis and Properties.

Leningrad, Zhurnal Obshchei Khimii, Vol 40, No 6, Jun 70, pp 1252-1255

Abstract: The reaction of allyl dichlrophosphine with secondary amines in an inert solvents (ether, hexane) in the presence of triethylamine or excess secondary amine yields the corresponding diamides of allylphosponous acid (I) I easily add Group VI elements, such as sulfur (in polar solvents) or selenium (without solvent), and thereby form diamides of alkylthioor allylselenophospho-nic acids. The IR spectra of the diamides were studied.

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USSR

UDC 547.341+542.955.1.2

LIORBER, B. G., KHAMMATOVA, Z. M., TARZIVOLOVA, T. A., RAZUMOV, A. I., Kazan' Chemical-Technological Institute imeni S. M. Kirov, Kazan, Ministry of Higher and Secondary Specialized Education RSFSR

"Studies of the Derivatives of Phosphinic and Phosphinous Acids. LXX. Esters of Epoxidized Phosphinic Acids"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 8, Aug 70, pp 1699-1704

Abstract: Reaction of unsaturated phosphinic acid esters containing allyl type radicals with 65-80% peracetic acid gave a series of β,γ-epoxyphosphinic acids. The structures of the products obtained were determined by IR and NMR spectra. The epoxides could be opened by aqueous HCl, yielding β,γ-dihydroxybutylmethylphosphinic acid esters. The reaction occurred smoothly, probably because of the inductive effect of the methyl group, which counteracted the influence of the P:O group. The epoxides were tested for chemosterilant activity against the common house fly: the monoepoxides were found inactive and the diepoxides showed sterilizing activity.

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USSR

UDC 547.241

RAZUMOV, A. I., LIORBER, B. G., ZYKOVA, T. V., BAMBUSHEK, I. YA., Kazan' Chemical-Technological Institute imeni S. M. Kirov, Kazan, Ministry of Higher and Secondary Specialized Education RSFSR

"Studies in the Series of Phosphinous and Phosphinic Acids. LXXIV. Intermediate Products of Arbuzov's Rearrangement of the Esters of Monoalkylphosphinous Acids"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 9, Sep 70, pp 2009-2010

Abstract: In the reaction of methyl iodide with saturated monoalkylphosphinous esters having branched alkoxyl groups, intermediate products may be isolated provided the reaction is carried out at a cold temperature. These compounds are colorless crystalline materials which can be stored for prolonged periods in cold. They are soluble to a limited extent in benzene and more soluble in chloroform and methylene chloride. At room temperature or on heating they decompose according to the second phase of the Arbuzov rearrangement, forming esters of alkylmethylphosphinic acids. According to the data from NMR spectroscopy these intermediate products 1/1 exist in the ionized form in both polar and nonpolar solvents.

USSR

UDC 538.27:547.341

RAZUMOV, A. I., LIORBER, B. G., ZYKOVA, T. V., RAMBUSHEK, I. YA., Kazan' Chemical-Technological Institute imeni S. M. Kirov, Kazan, Ministry of Higher and Secondary Specialized Education RSFSR

"Studies of the Derivatives of Phosphinic and Phosphinous Acids. LXVI. The Problem of Interaction Between the Double Bond and the Phosphorus Atom in Allylphosphinates and Phosphonites"

Leningrad, Zhurnal Obshchey Khimii, Vol 40, No 8, Aug 70, pp 1704-1707

Abstract: As a continuation of earlier studies, the previously synthesized derivatives of allylphosphinous- and -phosphinic acids were subjected to NMR spectroscopic analysis and compared with propyl analogues. It was determined that for all pairs examined the chemical shift of the phosphorus nucleus in the allyl derivatives was higher than in propyl analogues. Introduction of another allyl group resulted in a further shift of f_p towards the stronger field. Since the symmetry around the phosphorus atom was retained, the effect observed was due exclusively to the double bond introduced. Evidently the π-electrons of the C:C bonds interacted with

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USSR

RAZUMOV, A. I., et al, Zhurnal Obshchey Khimii, Vol 40, No 8, Aug 70, pp 1704-1707

free phosphorus electrons from the d-orbitals, thus increasing its electron density. This was accompanied by delocalization of the electron cloud in the allyl radical, and the C=C bond electrons affect the d-orbitals.

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USSR

UDC 615.214:547.349

RAZUMOV, A. I., LIORDER, B. G., ZAIKONNIKOVA, I. V., URAZAYEVA, L. G., and TARZIVOLOVA, T. A., Kazan' Chemical-Technological Institute Imeni S. M. Kirov

"Studies in the Series of Phosphinic and Phosphinous Acid Derivatives. LXXXVIII. Synthesis of Diallylphosphinic Acid Esters and Amides and Their Biological Activity"

Moscow, Khimiko-Farmatsevticheskiy Zhurnal, Vol 6, No 12, Dec 72, pp 24-28

Abstract: Addition of diallylphosphinic acid (I) with vigorous stirring to a toluene suspension of respective alcohols or amines, followed by a 3 hr reaction at 100° produced the desired esters and amides upon cooling. The following $(C_3H_5)_2P(:O)R$ products were obtained: R, b.p.°, d_4^{20}, and n_D^{20} being reported: $OCH_2CH(CH_3)_2NH_2 \cdot HCl$, -, -, -; $OCH_2(CH_2)_7CH_3$, 145-6/0.07 mm, 0.9467, 1.4660; $OCH_2(CH_2)_{10}CH_3$, 156-7/0.07 mm; 0.9301, 1.4670; $N<^{CH_2CH_2}_{CH_2CH_2}>CH_2$, 112-4/0.05 mm, 1.0279, 1.5600; $N<^{CH_2CH_2}_{CH_2CH_2}>O$, 132-4/0.05 mm 1.0950, 1.5100; $N(C_3H_7)_2$, 117-9/0.04 mm, 0.9535, 1.4810; and $N(C_4H_9)_2$, 124-6/0.04 mm, 0.9376,

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RAZUMOV, A. I., et al., Khimiko-Farmatsevticheskiy Zhurnal, Vol 6, No 12, Dec 72, pp 2 -28

1.4770. Propargyl ester of diallylphosphinic acid -- the most active agent -- was prepared by mixing the acid chloride of (I) with the alcohol and triethylamine in ether and stirring for 4 hrs. The product boiled at 97-8°/0.06 mm, d_4^{20}= 1.0529, and n_D^{20}= 1.4900. Acid chloride of (I) added to 3-aminobutanol-1 in 200 ml of dichloroethane followed by a 2 hr reaction at 60°, removal of the dichloroethane, addition of sodium alkoxide in absolute ether yielded 3-aminobutyl ester of (I) after centrifugation and repeated filtration; b.p. 173-6°/ 10^{-4} mm, d_4^{20}= 1.0466, n_D^{20} = 1.4900.

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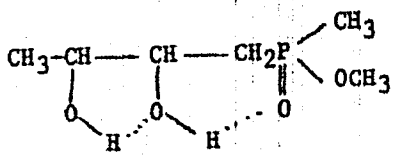
"The Nature of the Hydrogen Bond in Phosphorylated Glycols"

Leningrad, Zhurnal Obshchey Khimii, Vol 43 (105), No 2, Feb 73, p 438

Abstract: Hydrogen bonding in a phosphorylated glycol -- methyl 2,3-dihydroxybutylmethylphosphinate -- was studied by IR spectroscopy. A single band at 3260 cm^{-1} was observed in a concentrated sample, two bands at 3270 and 3370 cm^{-1} at a 0.02 M concentration in CCl_4, C_2Cl_4, C_6H_6, corresponding to two intramolecular hydrogen bonds.



'A' 'B'

Diluting the glycol with a solvent of low polarity -- dioxane -- breaks the bond A, showing only one IR band at 3388 cm^{-1}.

1/2 022 UNCLASSIFIED PROCESSING DATE--27NOV70

TITLE--EFFECT PRODUCED ON A CLOSED SPHERICAL SHELL BY NORMAL CONCENTRATED FORCES APPLIED AT ITS POLES -U-

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ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. DEMONSTRATION THAT WHEN A CLOSED SPHERICAL SHELL IS ACTED UPON BY A CONCENTRATED FORCE THE STRESS AND STRAIN STATE FAR FROM THE POINTS OF APPLICATION IS DESCRIBED IN A FIRST APPROXIMATION BY THE SAME FORMULAS AS IN THE CASE OF A SMOOTH SURFACE LOAD. IT IS ALSO SHOWN THAT IN THE NEIGHBORHOOD OF THE POINTS OF APPLICATION THE PROBLEM CANNOT BE REDUCED TO A TWO-DIMENSIONAL PROBLEM. THE SOLUTION TO THE PROBLEM IS SOUGHT IN THE FORM OF A LEGENDRE POLYNOMIAL SERIES. THEN THE SLOWLY CONVERGING PART OF THE SERIES IS SUMMED, AS A RESULT OF WHICH THE SOLUTION IS REPRESENTED AS THE SUM OF A RAPIDLY CONVERGING SERIES AND A CERTAIN QUANTITY WHICH VANISHES AT INFINITY IN THE NEIGHBORHOOD OF THE POINTS OF APPLICATION OF THE CONCENTRATED FORCE.

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SOME OF THE RESULTS OF A STUDY OF DERMAL HETEROGENIZATION INDUCED BY A LATENT VIRUS OF C57Bl/6J MICE

[Article by A.L. Liozner, G.Ya. Svet-Moldavskiy, D.N. Mamedze, P.P. Sokolov, T.A. Litovchenko, A.F. Bykovskiy, Moscow Scientific Research Institute of Viral Preparations, USSR Ministry of Health; Institute of Experimental and Clinical Oncology USSR AMS [Academy of Medical Sciences]; Institute of Sanitation and Hygiene, Georgian Ministry of Health; Institute of Epidemiology and Microbiology imeni N.F. Gamaleya, USSR AMS; Moscow, Vestnik Akademii Meditsinskikh Nauk SSSR, Russian, No 7, 1971, pp 74-81]

In 1965, in our experiments with sarcoma K-237, induced in inbred C57Bl/6J mice with the chemical carcinogen DMBA, we discovered the unusual phenomenon of tissular incompatibility. Skin transplants from mice with tumors to recipients of the same line consistently underwent rejection just as is the case with skin transplants of allogenic origin from another inbred line of mice (G.Ya. Svet-Moldavskiy et al., 1967a, b, c). Further investigation of this phenomenon, which was named "skin heterogenization," established that its onset is linked with the effect of a distinctive virus associated with sarcoma K-237 (G.Ya. Svet-Moldavskiy et al., 1968a, b). These investigations define two directions of research which have been developed in recent times by a number of authors in many laboratories the world over: 1) investigation of appearance of new antigens in normal tissues of tumor carriers and, as a more general question, investigation of antigen exchange between cell systems in the organism and in vitro; 2) investigation of viral heterogenization of normal cells and the role of such phenomena in pathology, in particular with reference to immunopathological states. Thus, investigation of this problem is timely both for general immunology and for such directions in it as transplantation and antitumor immunity. In this report we should like to sum up some of the results of investigation of skin heterogenization on the example of the experimental model we have described, and to discuss the present status of the problem as a whole. Like any new problem, this one presents a number of debatable aspects which are also going to be discussed.

Material and methods. The experiments were conducted on inbred C57Bl/6J, BALB/C, CBA, C3H, C3HA, T6T6 mice which were obtained from the Stolbovaya Nursery of the USSR AMS. Hybrids from crosses between C57Bl/6J and BALB/c mice were obtained in our animal shelter. To induce tumors, we gave the

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[illegible] oil solution, in a dosage of 0.5 mg. Tumors developed at the site of injection of the carcinogen within 3-5 months. They were transferred to syngeneic mice by means of subcutaneous implantation of small pieces. The method of preparing virus-containing ascitiform tumor extracts and of testing them on mice was described previously (G.Ya. Svet-Moldavsky et al., 1968a, b, 1970).

Skin transplants were transferred following a slight modification of the method of Billingham and Medawar (1951). Body skin transplants, including all layers, 3.5x2 or 2x2 cm in size were applied to recipients by means of an adhesive strip along the margins of the transplant and site. For this purpose we used a special preparation of BF-6 adhesive (adhesive for microtrauma). The first evaluation of the transplanted skin was made on the 5th-6th day after transplantation; primary acceptance of any type of transplant normally occurred within this time. At this time we rejected all recipients showing signs of injury or infection of the transplants. The percentage of such rejects ranged from zero to ten in the different experiments. In order to ascertain the time of transplant rejection, they were examined daily. The final criterion of acceptance or rejection was the presence or absence of hair growth, which was in the opposite direction from growth on the recipient's back because the graft was rotated at the time of transplantation.

Chief phenomena and etiological agent. The reaction of rejection of skin grafted to syngenic C57Bl/6J recipients from carriers of sarcoma K-237 was identical to the reaction of rejection of allogenic transplants (of skin from BALB/c mice to C57Bl/6J recipients). Both, as well as normal syngenic transplants, showed vascularization by the 6th day and were accepted. Development of rejection occurred between the 8th and 11th experimental day (Table 1). Histological examination of the transplants also revealed complete similarity of rejection of syngenic heterogenized and allogenic skin. In both instances (figures 1-4), on the tenth day the reaction was characterized by marked dilatation of vessels and arrested circulation. There was mixed cellular infiltration of the transplants, and this is quite typical precisely for the rejection reaction in mice (Brent, 1958). In addition to mononuclears, there was a considerable number of polymorphonuclear leukocytes in the transplant. There were also marked signs of activation of connective tissue in the transplant dermis and adhesion layer. The agent "responsible" for development of heterogenization of the skin presented properties that were typical for viruses. It could be separated from tumor cells, it remained in acellular extracts of the tumor, ultracentrifugate, and ultrafiltrates (for more details see G.Ya. Svet-Moldavsky et al., 1970). Table 2 gives the summary data on the heterogenizing effect of the tumor and of extracts thereof. As seen in Table 2, in about 1,000 cases of transplantation, there was heterogenization of the skin by the tumor or virus-containing extract, whereas in the control (provided accurate consideration of primary healing of the grafts was made) no rejections were observed. It has been shown (D.M. Manukian et al., 1970; G.Ya. Svet-Moldavsky et al., 1970) that skin heterogenization occurs both after infection with tumor extract and after transplantation of heterogenized skin. In the latter event, the phenomenon developed after each successive transplantation for 15 passages, starting in 1966. Thus, the viral nature of the agent is confirmed by the fact that it can be separated from cells, its

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"Hydrogen Introduction Into Steels and its Effect on Plasticity Properties"

Moscow, Teploenergetika, No 2, Feb 71, pp 72-74

Abstract: Results of investigating the introduction of hydrogen into perlitic steels 22K , 16GNM , 15KhM , structural steel, and stainless steel 1Kh18N9T are discussed by reference to tabulated data showing hydrogen contents of investigated steels, their changes of mechanical properties after hydrogen introduction depending on the cold-hardening extent, and the mechanical characteristics of steels 22K , 16GNM , and structural steel after electrolytic hydrogen introduction. It was found that structural steel is the least disposed to hydrogen absorption, that plastic deformation up to 15 % increases the sensitivity of all perlitic steels

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to hydrogen embrittlement, and that Trilon treatment promotes conservation of plasticity properties by decreasing the hydrogen content. A thermal treatment for removal of the cold-hardening is considered to be obligatory and complexone treatment to be beneficial for decreasing the possibility of hydrogen embrittlement. One illustr., four tables.

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